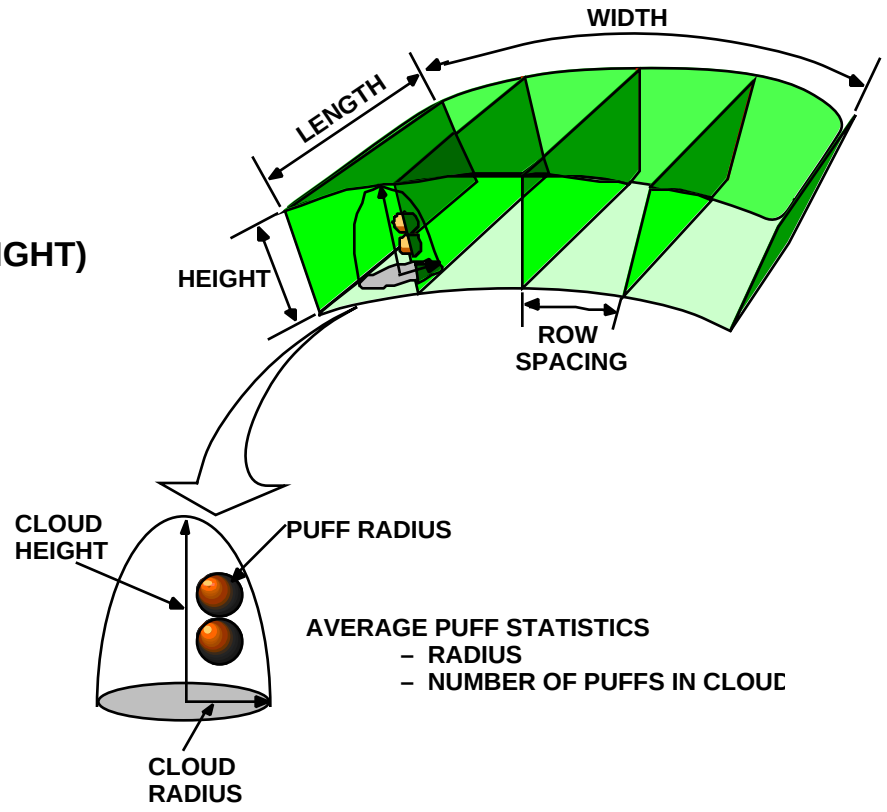
HIERARCHICAL WEATHER OBJECTS DEFINED BY STATISTICAL PARAMETERS U)

8351-20796-1/I-314JB

SMALL NUMBER OF PARAMETERS NEEDED TO DEFINE MULTI-RESOLUTION CLOUD SCENE (CURRENTLY FROM 100 km TO 10 m)

- AVERAGE SLAB STATISTICS
  - POSITION
  - ORIENTATION
  - SIZE (LENGTH, WIDTH, AND HEIGHT)
- AVERAGE ROW STATISTICS
  - ROW SPACING
  - ROW LENGTH
- AVERAGE CLOUD STATISTICS
  - MEANDER ACROSS ROW
  - SPACING ALONG ROW
  - HORIZONTAL RADIUS
  - HEIGHT SCALE FACTOR

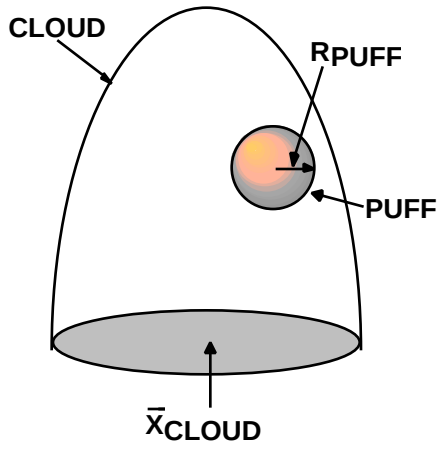


8351--23596-03/I-313

STOCHASTIC INDEXING (U)

- **MINIMIZES DATA STORAGE FOR SCENE REPRESENTATION**
- **PROVIDES REPEATABLE PROCESS FOR LOS's THAT INTERSECT SAME VOLUME**

- OBJECT CHARACTERISTICS GENERATED BY RANDOM DRAWS ON AVERAGE STATISTICAL PARAMETERS FOR OBJECT
- SEED FOR RANDOM DRAW DEFINED FROM STATE OF OBJECT IN NEXT HIGHER HIERARCHICAL LEVEL



$R_{PUFF} = \bar{R}_{PUFF} * [1 + \tilde{rv}(s)] / 2$

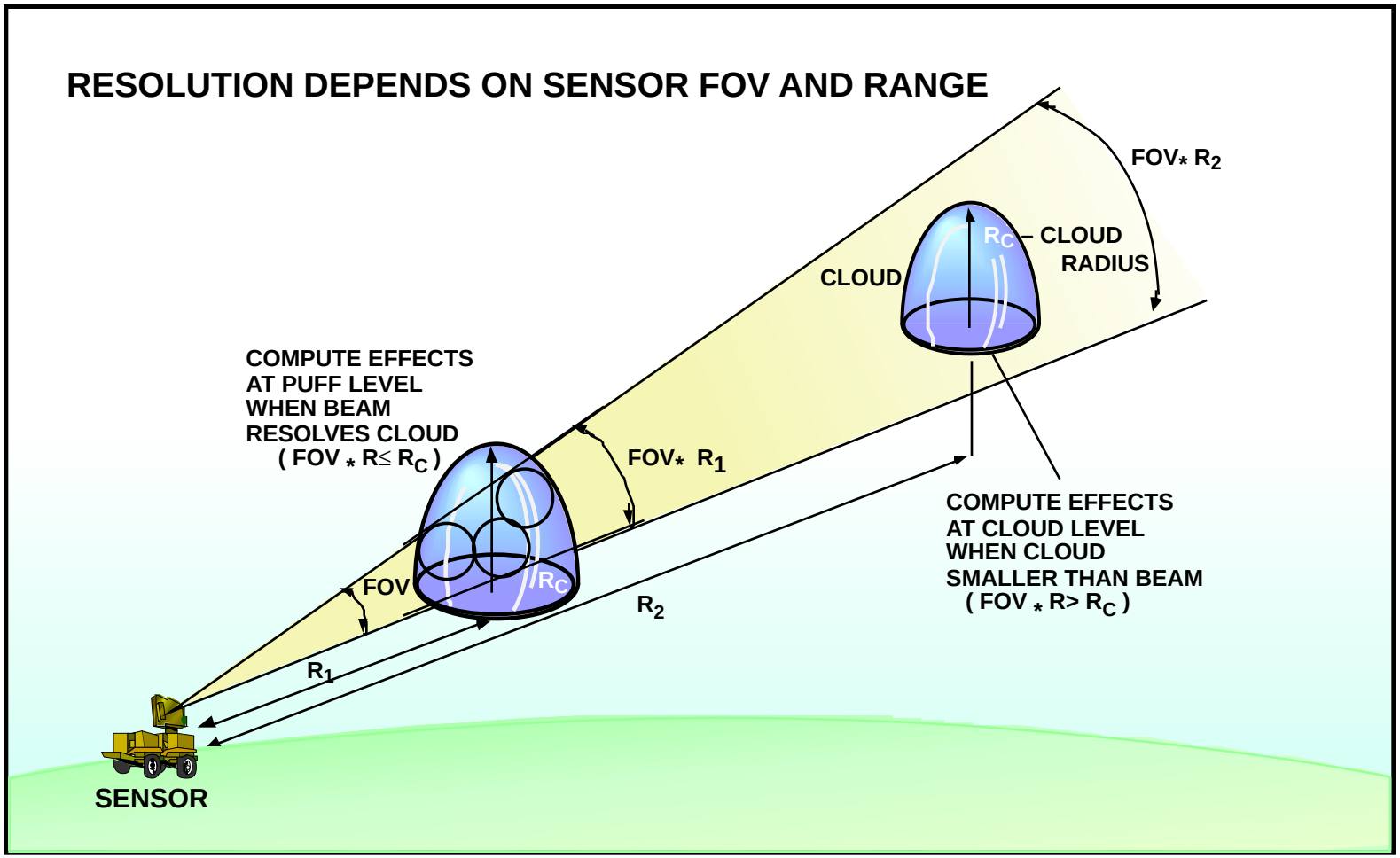
$\bar{R}_{PUFF}$ = AVERAGE PUFF RADIUS

$\tilde{rv}(s)$ = DRAW FROM UNIFORN RANDOM DISTRIBUTION (0, 1)

s = SEED FOR RANDOM DRAW = $f(\vec{X}_{CLOUD})$

DYNAMIC OBJECT RESOLUTION IN FASTPROP (U)

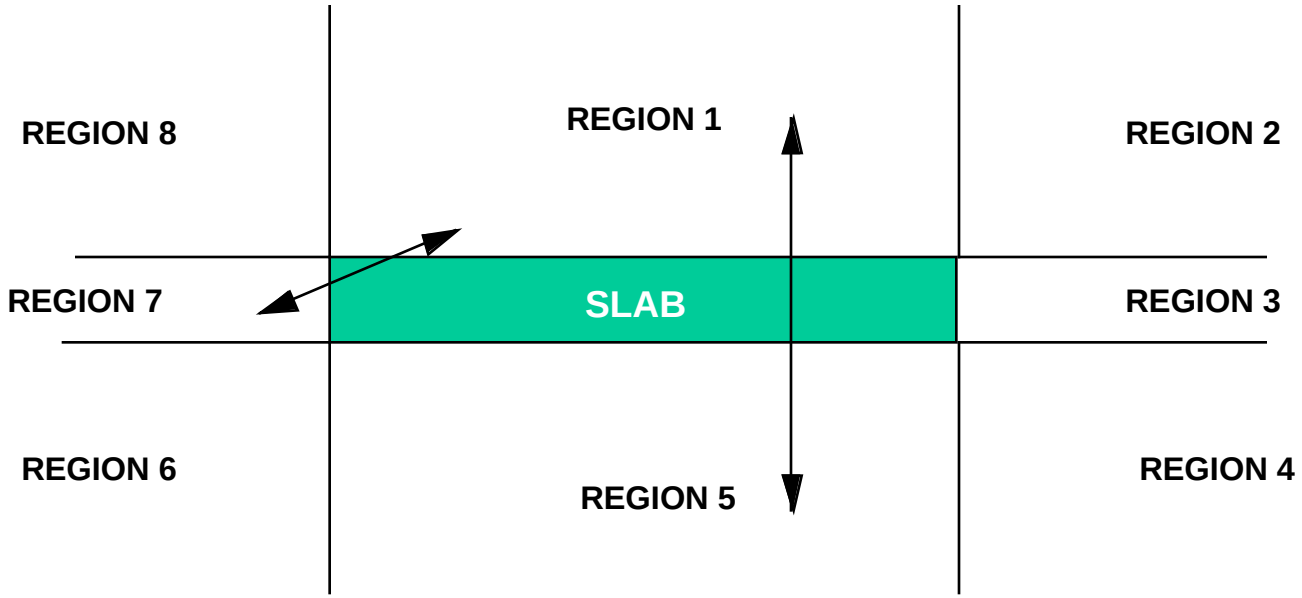
8351-20796-24/I-313CVB



8351--23596-03/I-313

FIRST FILTER (U)

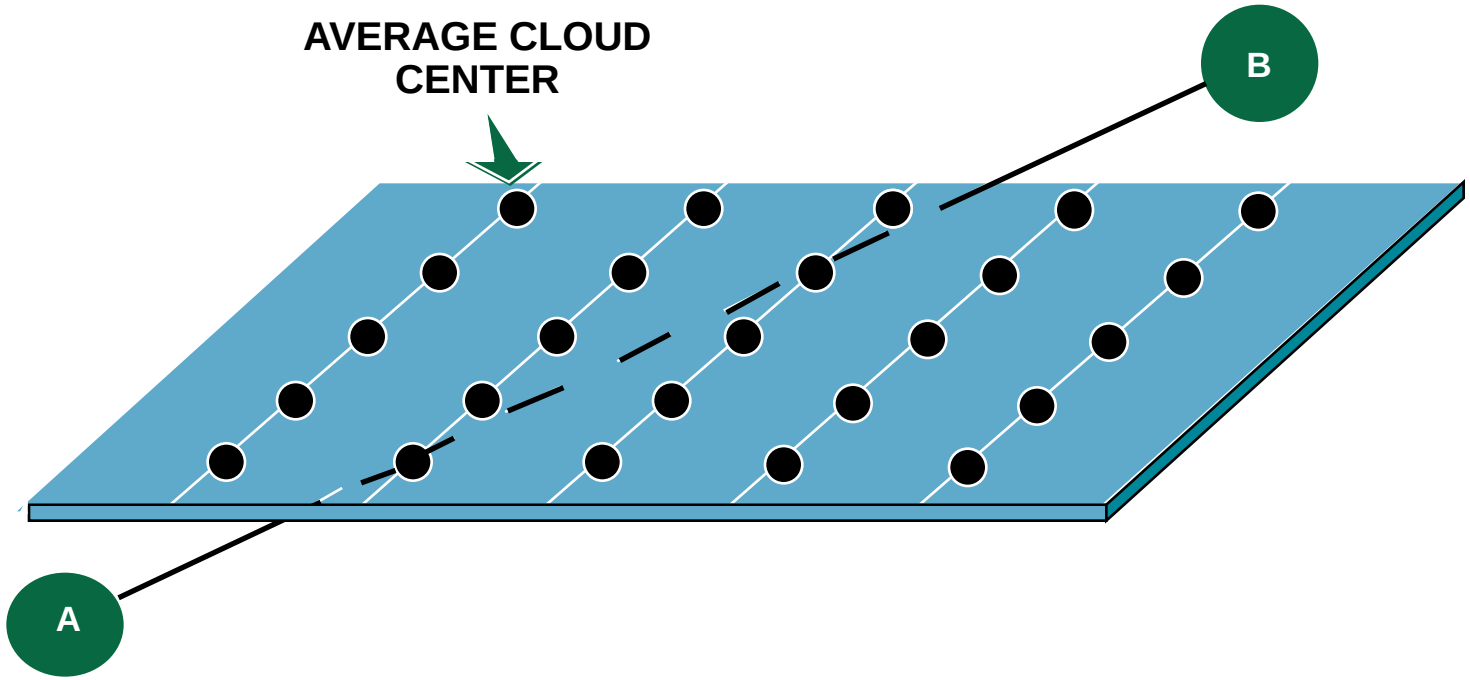
8351-22296-4/i-313CVB



- UNAMBIGUOUS LOS / CLOUD INTERSECTION REGIONS
  - LOS FROM REGION 1 TO 5 INTERSECTS SLAB
  - LOS FROM REGION 2 TO 4 DOES NOT INTERSECT
- AMBIGUOUS LOS / CLOUD INTERSECTION REGIONS
  - LOS FROM REGION 1 TO 7 POSSIBLY INTERSECTS SLAB
  - FURTHER FILTERING REQUIRED AT SLAB LEVEL
- PROCEED TO SECOND FILTER IF SLAB INTERSECTED

8351--23596-03/I-313

SECOND FILTER (U)



- FILTER REDUCES FROM 50,000 OBJECTS TO ~4-8 OBJECTS
  - COMPUTE LOS ENTRY AND EXIT POINTS FROM SLAB
  - CALCULATE WHICH CLOUDS COULD BE INTERSECTED BASED ON SCENE FUNCTIONAL REPRESENTATION